

## RAINFALL AT "HUSBAND'S," BARBADOES.

Days.	Jan.	Feb.	Mar.	Apl.	May	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1					.72		.11 a				.61		
2		.01	.01		.06		a		.05	1.20	.65		
3		.05	.01			a	.03	.03	1.26			f	.07
4		.12 a	.31		a	.07 a			.52		.62 f	f	.06
5	a	.01	.03					.26	.06	.59	.08		.06
6		.71	.09 a	.07				2.73	f	f			.54
7		.11	.10	.15			.02		.91				.25
8		.05	.05					.10 f		.05	.54		.14
9		.80		.03				.15		1.28			.12
10		.09				f	.05 f	.68	3.09	.20			.04
11					.13	.06		.75	4.80	.27		b	
12		f		f	1.00 f		.05	.07		1.20 b			.04
13	f		.54					.22	b	b			
14		.06	.16 f								.05		
15		.14				.05		b	.18	6.30			
16			.02		.14	.05	.15	.02	1.11				.01
17		.01				b	b	.50	.02				.37
18		.11		.03			.11	.03	.03				
19		.15		.02	b	.07	.15	.03	.07		.10 n	n	.06
20		b	b	b				.17	.09 n				
21	b							.11 n	.03 n				
22					.27	.08	.46	2.20	.13		.02		.05
23		.73			.01	.04	.50 n	.32	.76				
24		.03				n	.14		.02	.33			
25		.04		.01	.20		n	.11	.21				.11
26		.20		n	n	.07		.30	.23		.10 a	a	.06
27		.03 n		.06	.25			.15			a	.03	
28	n		n		.25			.01	.28				
29						.08		.10 a	.05 a	.02	.03		.17
30					.06	.01		1.20	.24				.01
31		.10						a	.20	.13	1.08		.05
Sum	3.55	1.32	0.37	1.24	1.88	0.08	5.41	7.03	13.35	14.29	1.67	2.15	

## REPLY TO DR. T. STERRY HUNT.

By F. A. GENTH.

*(Read before the American Philosophical Society, July 17, 1874.)*

Dr. T. Sterry Hunt has published in the Proceedings of the Boston Society of Natural History, Vol. XVI., March 4th, 1874, an article, entitled: "*On Dr. Genth's Researches on Corundum and its associated minerals,*" in which he charges me—in common with many others—of having fallen into errors and of having been led to conclusions wholly untenable, for a lack of a clear understanding as to replacement, alteration and association in the mineral kingdom.

He then gives an outline of the manner in which the various alterations in a mineral species may take place, by replacement, envelopment and epigenesis with examples for each, and dwells at more length upon the fallacy of considering the alterations of many minerals and rock masses as the result of an epigenic process; a doctrine which has been embodied in the dictum of Prof. Dana: "*regional metamorphism is pseudomorphism on a broad scale.*"

He then refers briefly to the results of my investigation on corundum, in which I have shown that by "epigenic" pseudomorphism this mineral has been altered into numerous more complex species and rock masses—and winds up by stating that he *not only has carefully studied*

*my paper, but had also examined the extensive collection of specimens upon which my conclusions were based, and that—all the phenomena in question are nothing more than examples of association and envelopment, and that the corundum-bearing veins had their parallels in the granitic veins with beryl and tourmaline in the White Mountain rocks, and the calcareous veinstones with apatite, pyroxene, phlogopite and graphite of the Laurentian rocks.*

I may be permitted to say a few words in reply to Dr. Hunt's assertion, that I had fallen into errors and had been led to wholly untenable conclusions.

When I had the good fortune to obtain a few years ago the *first real pseudomorph* after corundum—the spinel from India, and afterwards brought together numerous specimens of analogous alterations, showing from the *same* locality crystals of corundum without any, and others representing all stages of alteration from a thin coating to the complete disappearance of every vestige of corundum, and when I proved that such changes have resulted in the conversion of corundum into about two dozen mineral species; I could not understand how any unprejudiced mind could arrive at any other conclusions, but that these extraordinary occurrences which I have described, were the result of epigenic pseudomorphism.

This opinion has been adopted almost without exception by all who have had an opportunity to examine my specimens, or who have studied my paper. If Dr. Hunt differs from me, I certainly will not deny to him the right to believe what suits his own notions, but when he boldly charges me with having committed errors, I want better proofs than a repetition of his views, with which we were familiar long ago. He certainly has not a single fact which could show the fallacy of my conclusions, or he would have produced it.

The corundum alterations have nothing in common with the Fontainebleau crystals, or with stanniferous orthoclase; the green and red tourmalines from Paris, Me., or the beryls filled with orthoclase, or the zircon and galenite filled with calcite, and cannot be explained *rationally* as examples of *association* and *envelopment*.

To give strength to his statements, however, Dr. Hunt says that he had "*examined*" with me "*the extensive collection of specimens upon which my conclusions were based.*" When Dr. Hunt favored me with a visit, I was in hope that he *would examine* my specimens, but his time was so short that he saw only about one-third of them, and the "*examination*" (! ?) of these was finished in about *five minutes*.

As to his last sentence, I must confess that I am unable to discover the least parallelism between the corundum-bearing veins and the granitic veins, with beryl and tourmaline, so common in the White Mountains, and the calcareous veinstones with apatite, pyroxene, phlogopite and graphite of the Laurentian rocks;—but can see in the former nothing but

the product of a partial, and in many instances of a pretty thorough alteration of the original corundum into micaceous and chloritic schists or beds, or, as Prof. Dana would express it: "*a pseudomorphism on a broad scale.*"

UNIVERSITY OF PENNSYLVANIA, July 4th, 1874.

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CONTRIBUTIONS FROM THE LABORATORY OF THE UNIVERSITY OF PENNSYLVANIA.

NO. II.

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ON AN IMPROVEMENT OF THE BURETTE VALVE.

BY GEO. A. KOENIG, PH.D.

(*Read before the American Philosophical Society, August 21, 1874.*)

Strictest simplicity of construction must be considered as the first requirement of any tool or apparatus, besides fitness for all work within its sphere of action. Frequently we meet with constructions in which fitness has been sacrificed to a considerable extent for the sake of simplicity, and quite as often the reverse. There are cases, indeed, in which circumstances demand even a certain degree of one-sidedness, but in my judgment a more complicated apparatus, overcoming defects of working attached to a simpler device, is practically the more desirable of the two.

When Frederick Mohr gave his rubber tube valve to volumetric analysis, he had indeed hit, like a true genius, upon the simplest contrivance imaginable. To this piece of apparatus must be ascribed the rapid adoption of volumetrical determinations by analytical chemistry. No matter how simple the volumetrical reactions might be, if they had to be executed by an unhandy manipulation, the practical chemist would rather keep on with his accustomed precipitations and weighings.

Let us consider now the conditions under which the burette will satisfy all demands which can be made upon it.

1. *The instrument must not engage the hands of the operator during the operation.*

This condition requires the burette to be fixed and its position to be quite independent from the person of the manipulator.

2. *The instrument must allow a rapid discharge of its liquid contents to any desired volume, without the application of another force than that of gravitation.*

This condition requires the tube to be fixed vertically and to be furnished with a valve.

3. *The valve must allow to interrupt the current instantaneously and completely, and also the regulation of the liquid current from the smallest drop to a full stream.*

4. *The working of the valve must be easy, not require any effort on the*